



A new combination for an Australian fern: *Hymenasplenium wildii* (Aspleniaceae)

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Introduction

The Aspleniaceae is a species-rich family of ferns distributed on all continents except Antarctica, and includes more than 700 species (Kramer & Viane 1990; Smith et al. 2006), with 38 species currently recognised in Australian territory (DuPuy 1993; Green 1994; Jones 1996; Brownsey 1998; Short et al. 2003; Short et al. 2011). The combination of linear sori and clathrate scales that are possessed by all Aspleniaceae is usually sufficient to distinguish Aspleniaceae from other fern families (Kramer & Viane 1990). Apart from this unifying set of features, the Aspleniaceae are highly variable in morphology. Some authors have treated the Aspleniaceae as comprising a sole large and variable genus, *Asplenium* L. (e.g. Kramer & Viane 1990). However, the diverse morphology in the Aspleniaceae has prompted others to also acknowledge several small segregate genera. One of these segregates is *Hymenasplenium* Hayata, originally separated from *Asplenium* based on its differing rhizome anatomy (Hayata 1927) and later found to have distinct chromosome numbers in the family (e.g. Mitui et al. 1989; Cheng & Murakami 1998) and to comprise a molecular clade sister to the remaining Aspleniaceae (Murakami et al. 1999; Schneider et al. 2004). Of all the segregate genera, it is the only genus now generally accepted (Murakami 1995; Murakami et al. 1998; Murakami et al. 1999; Sasaki 2008; Brownsey & Perrie 2011;

Abstract

Hymenasplenium L. has not previously been recognised in Australia. Here we recognise *Asplenium unilaterale* Lam. and *A. excisum* C.Presl, which occur in Australia and other paleotropical areas, in *Hymenasplenium* (their combinations in *Hymenasplenium* have been made previously). Molecular phylogenetic analyses have confirmed that a third Australian species, *Asplenium wildii* F.M.Bailey, endemic to the Daintree area of northeast Queensland, also belongs to *Hymenasplenium*. The new combination *Hymenasplenium wildii* (F.M.Bailey) D.J.Ohlsen is made here.

Keywords: *Asplenium*, Systematics, Taxonomy

Gabancho & Prada 2011; PPG 1 2016). It includes at least 30 species (PPG 1 2016), but has not previously been recognised in Australia (Brownsey 1998; APC 2018). *Hymenasplenium* can be identified in the field by its thin creeping rhizome, pinnate fronds, thin membranous pinnae and its preference for constantly wet and humid sites such as waterway embankments.

In Australia two species referable to *Hymenasplenium* were previously known: the generic type *H. unilaterale* (Lam.) Hayata and *H. excisum* (C.Presl) S.Linds. However, in previous Australian treatments subsequent to the recognition of *Hymenasplenium* these two species have

been placed in *Asplenium* (Brownsey 1998; APC 2018). Both species are widespread outside of Australia but are rare in Australia, particularly *H. unilaterale* which is known from a single locality. In Australia both species are only known to occur in the wet tropics of northeast Queensland on the Atherton Tableland. A third species, *A. wildii* F.M.Bailey (Figure 1), is morphologically similar to these species except that it is much smaller in overall size. The possibility that it represents a diminutive form of *H. unilaterale* has been mentioned (Brownsey 1998) but its affinity to *Hymenasplenium* has never been formally proposed through a combination in *Hymenasplenium*.



Figure 1 *Hymenasplenium wildii* on the embankment of an unnamed creek, Cape Tribulation section of Daintree National Park, north-east Queensland.

A chloroplast DNA phylogeny of Australian Aspleniaceae included *A. wildii* and both of the other Australian *Hymenasplenium* (Ohlsen et al. 2014). That phylogeny demonstrated the distinctiveness of *A. wildii* from *H. unilaterale* because *A. wildii* was resolved as sister to a clade of *H. unilaterale* and *H. excisum* (both represented by multiple accessions and forming monophyletic groups), rather than nesting in *H. unilaterale*. The phylogeny also clearly showed that *A. wildii* is placed with strong support (Bayesian posterior probability of 1; maximum likelihood bootstrap support of 100%) in the *Hymenasplenium* clade and, thus, should be classified in that genus. A new combination for *A. wildii* in *Hymenasplenium* is made here accordingly.

Taxonomy

The following species of *Hymenasplenium* are recognized as occurring in Australia:

Hymenasplenium unilaterale (Lam.) Hayata, *Bot. Mag. (Tokyo)* 41: 712 (1927)

Asplenium unilaterale Lam., *Encycl.* 2: 305 (1786).

Type: MAURITIUS, *P. Commerson*: n.v.

Hymenasplenium excisum (C.Presl) S.Linds., *Thai Forest Bull. Bot.* 37: 69 (2009)

Asplenium excisum C.Presl, *Epimel. Bot.* 74 ('1849') [1851].

Type: PHILIPPINES, Luzon, *H. Cuming* 110; syntypes: BM, K, PRC.

Hymenasplenium wildii (F.M.Bailey) D.J.Ohlsen comb. nov.

Basionym: *Asplenium wildii* F.M.Bailey, *Bot. Bull. Dept. Agric. Queensland* 4: 20, tt. 1–2 (1891).

Type: Queensland: on rocks, Daintree River, 1891, C.J. Wild (lectotype: BRL AQ0144732 image!; isolectotypes: BM 001045316 image!, P 00642905 image!).

This species has been thoroughly described and illustrated by Andrews (1990) and Brownsey (1998) and a further illustration is provided by Bailey (1892).

Distribution: Cape Tribulation and Daintree areas, north-east Queensland.

Three holdings (at BRL, BM and P) exist for the type but Bailey did not designate a holding that would serve as the holotype and technically the three holdings

were originally syntypes. Brownsey (1998) listed the BRL specimen as the holotype, and as such inadvertently lectotypified the BRL specimen, rendering the BM and P specimens as isolectotypes (see Prado et al. 2015). The BRL specimen is from Bailey's home institution and includes one of the fronds illustrated in the protologue (in contrast to the BM and P sheets that were not illustrated).

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